

## CLAIMS

1. A production plan devising system for formulating a production plan by means of simulating movement of a product  
5 in a factory by an event-based simulator through use of a production process model and a production rule,  
the production plan devising system comprising:  
a time-interval-based simulator for computing the status of a production process at given time intervals; and  
10 a rule generator for automatically deriving the production rule through use of the time-interval-based simulator.
2. The production plan devising system according to claim  
15 1, wherein  
the production rule is formulated by means of a machine learning method based on a consecutive optimization technique using an artificial intelligence technique.
- 20 3. The production plan devising system according to claim 1, wherein  
the rule generator is constituted by a neural network.

4. A production plan devising method for formulating a production plan by means of simulating movement of a product in a factory by an event-based simulator through use of a production process model and a production rule,

5 the production plan devising method employing:

a time-interval-based simulator for computing the status of a production process at given time intervals; and

a rule generator for automatically deriving the production rule through use of the time-interval-based

10 simulator,

the production plan devising method comprising:

a step for repeatedly devising a production plan over and over again by the time-interval-based simulator,

a step for applying mechanical learning based on a  
15 consecutive optimization technique to the rule generator,

a step for automatically formulating the production rule,

a step for using a generated production rule by the event-based simulator, and

a step for formulating a production rule.

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5. A production plan devising program for formulating a production plan by means of simulating movement of a product in a factory by an event-based simulator through use of a production process model and a production rule,

5 the production plan devising program comprising:

a time-interval-based simulator for computing the status of a production process at given time intervals; and

a rule generator for automatically deriving the production rule through use of the time-interval-based

10 simulator, wherein

there are performed procedures by means of which the time-interval-based simulator repeatedly devises a production plan over and over again, thereby applying mechanical learning based on a consecutive optimization technique to the rule  
15 generator, so that the production rule is automatically formulated and the event-based simulator uses a generated production rule, thereby formulating a production rule.

6. A production system comprising:

20 a simulator for repeatedly computing the amount of WIP in manufacturing processes; and

a control system which determines a parameter to be used in computation of the simulator such that a computation result of the simulator becomes equal to an allowable range or less,  
25 and which controls the manufacturing processes on the basis

of the parameter.

7. The production system according to claim 6, wherein  
the simulator comprises: a time-interval-based simulator  
5 for computing the status of a production process at given time  
intervals, and a rule generator for automatically deriving the  
production rule through use of the time-interval-based  
simulator, and  
the simulator repeatedly computes the quantity of WIP  
10 in manufacturing processes through use of a production rule  
generated by the generator.

8. The production system according to claim 6, wherein  
the control system has measurement equipment for  
15 measuring the amount of actual WIP in manufacturing processes;  
and,

when the amount of actual WIP measured by the measurement  
equipment within a given cycle has become equal to a computation  
result of the simulator, the control system suspends production  
20 in manufacturing processes and resumes production in the next  
cycle.

9. The production system according to claim 8, wherein  
the given cycle can be variably set.

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10. A production method comprising:
- a step for repeatedly computing the amount of WIP in manufacturing processes by means of a simulator;
- a step for determining a parameter to be used in computation
- 5 of the simulator such that a computation result of the simulator becomes equal to an allowable range or less; and
- a step for controlling the manufacturing processes by a control system on the basis of the parameter.
- 10 11. The production method according to claim 10, wherein the simulator comprises: a time-interval-based simulator for computing the status of a production process at given time intervals and a rule generator for automatically deriving the production rule through use of the time-interval-based
- 15 simulator, and
- the simulator repeatedly computes the quantity of WIP in manufacturing processes through use of a production rule generated by the generator.
- 20 12. The production method according to claim 10, wherein the control system has measurement equipment for measuring the amount of actual WIP in manufacturing processes; and,
- when the amount of actual WIP measured by the measurement
- 25 equipment within a given cycle has become equal to a computation

result of the simulator, the control system suspends production in manufacturing processes and resumes production in the next cycle.

- 5 13. The production method according to claim 12, wherein the given cycle can be variably set.

14. A program to be performed by a production system, the program comprising:

- 10 a step for repeatedly computing the amount of WIP in manufacturing processes;

a step for determining a parameter to be used in computation of the simulator such that a computation result of the simulator becomes equal to an allowable range or less; and

- 15 a step for controlling the manufacturing processes on the basis of the parameter.

15. The program according to claim 14, wherein

- the production system comprises: a time-interval-based  
20 simulator for computing the status of a production process at given time intervals, and a rule generator for automatically deriving the production rule through use of the time-interval-based simulator, and

- the simulator performs processing pertaining to a step  
25 of repeatedly computing the quantity of WIP in manufacturing

processes through use of a production rule generated by the generator.

16. The program according to claim 14, wherein

5 the control system has measurement equipment for measuring the amount of actual WIP in manufacturing processes; and,

when the amount of actual WIP measured by the measurement equipment within a given cycle has become equal to a computation  
10 result of the simulator, the control system suspends production in manufacturing processes and resumes production in the next cycle.

17. The production method according to claim 16, wherein  
15 the given cycle can be variably set.

18. A recording medium on which the program defined in any one of claims 14 to 17 is recorded.

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